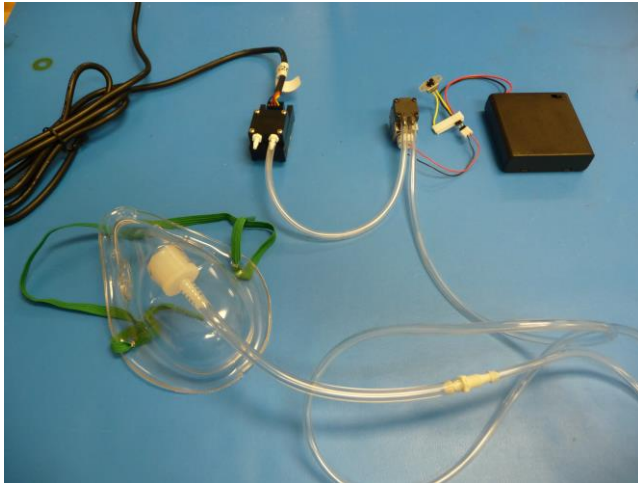


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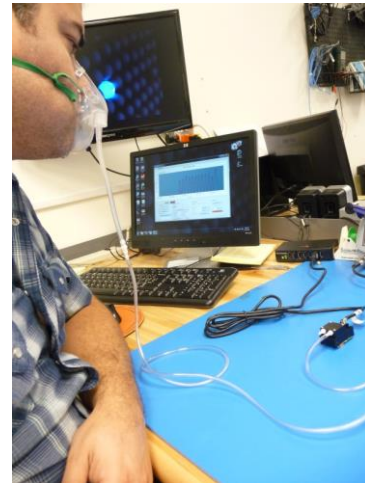
# AN129: Capnographic Testing of GSS SprintIR CO2 Sensor

The GSS SprintIR carbon dioxide sensor differs from similar sensors due to its speed. Most sensors are capable of recording data in the 2Hz range – at 20Hz, the SprintIR is literally 10 times as fast. But what does this mean in real-world testing? We decided to find out.

To create a test for the SprintIR sensor, we used a standard medical face mask, a KNF 0.5 liter/minute gas pump, and GSS software wide-range 20% CO2 sensor (GC-0017). Since normal human breath is up to 5% CO2, we felt this was the best match for our test to insure capturing data that may exceed the 5% threshold. The setup is shown below:

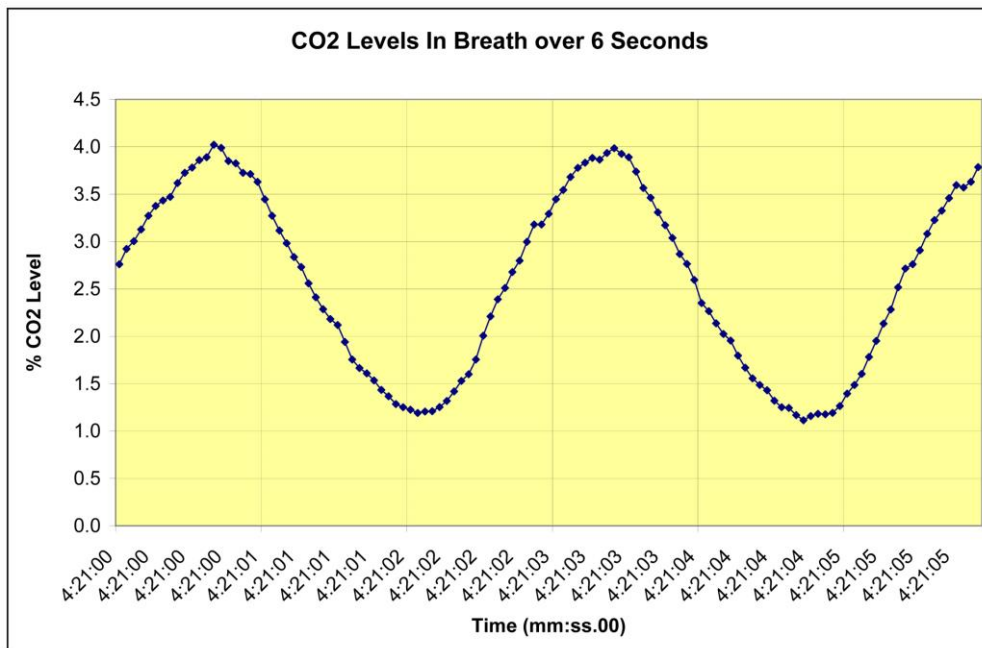


Mask attached to pump, then to SprintIR sensor



Test being run

Here are the results we achieved:



We are measuring the CO2 concentration and end tidal point 20 times per second. No other CO2 sensor is currently capable of this performance.

For a complete Capnographic Package the following items are needed along with a medical face mask:

- GC-0017 (0-20%) SprintIR CO2 Sensor
- CM-0013 Tube Cap Adapter for SprintIR (INSTALLED at time of order)
- CM-0032-GC SDK Cable to convert the GC-0017 to a Sensor Development Kit (Cable INSTALLED at time of order)
- CM-0111 Sensor Pump Kit
- CM-0202 UV Flux 25% Oxygen Sensor Development Kit
- CM-0203 UV Flux Oxygen Sensor Tube Cap (INSTALLED at time of order)
- TUB—0003 Nafion Tubing

Below are links to the products listed above:

- GC-0017 (0-20%) SprintIR CO2 Sensor
  - <http://www.co2meter.com/collections/co2-sensors/products/sprintir-100-percent-co2-sensor>
  - NOTE: the 20% sensor is best suited since the range you will be measuring is approximately 5% & you want to make sure you capture all the data that may exceed the 5% threshold
- CM-0013 Tube Cap Adapter for SprintIR
  - <http://www.co2meter.com/collections/co2-sensors/products/c20-sensor-tube-cap-adapter>
- CM-0032-GC SDK Cable to convert the GC-0017 to a Sensor Development Kit (Cable INSTALLED at time of order)
  - <http://www.co2meter.com/collections/co2-sensors/products/sdk-sensor-replacement-cables>
  - NOTE: the SDK intelligent cable which provides power to the sensor and connectivity to our complimentary software (downloadable from our website <http://www.co2meter.com/pages/downloads> ) allowing for sensor configuration & data logging.
- CM-0111 Sensor Pump Kit
  - <http://www.co2meter.com/collections/co2-sensors/products/gas-sensor-micro-pump>
- Another consideration would be to include an Oxygen Sensor Development Kit with tube cap. We recommend the CM-0202 UV Flux 25% Oxygen Sensor SDK & the CM-0203 UV Flux Oxygen Sensor Tube Cap.
  - <http://www.co2meter.com/collections/co2-sensors/products/uv-flux-oxygen-sensor>
  - NOTE: The CO2 sensor must be first in the series as the O2 sensor may generate heat which could affect the sample. (see page 3 for diagram)
- TUB—0003 Naphion tubing is recommended to remove water vapor form the gas sample providing additional protection to the sensor
  - <http://www.co2meter.com/collections/co2-sensors/products/nafion-gas-sample-drying-tubing>

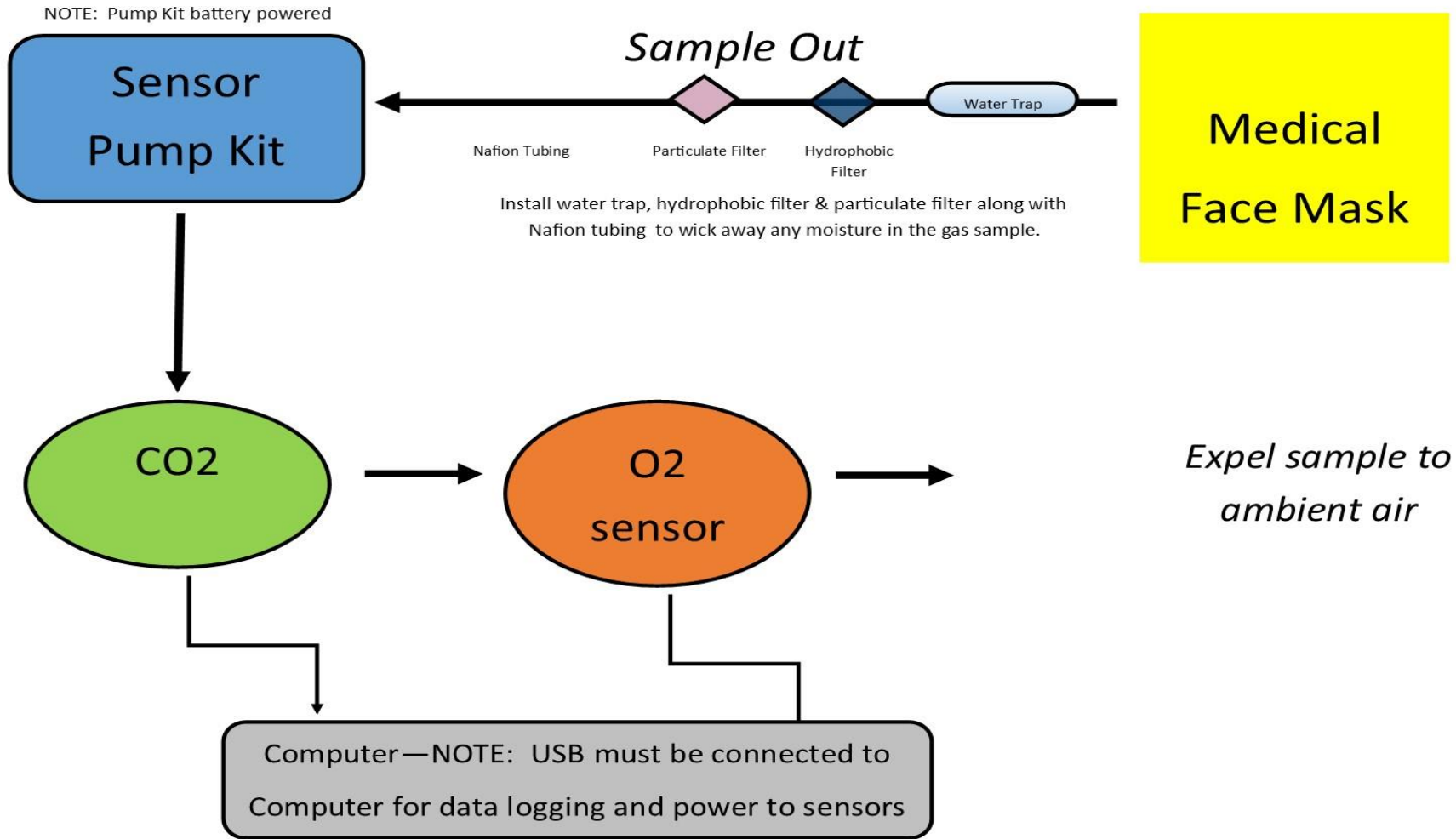
NOTE: the Sensor Pump Kit (CM-0111) includes a water trap & hydrophobic filters which can also be used along with the Nafion Tubing to protect the sensor from moisture in the sample.

Please contact us directly with any questions or quotation requests.

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**Sampling multiple sensors in series using a Sensor Pump Kit for capnographic application**

The pump is designed to PUSH the gas sample into the membrane/chamber of the sensor for accurate readings.

CO<sub>2</sub> must be first in the series when including an O<sub>2</sub> sensor which may generate heat which could affect the sample.

The Sensor Development Kits include the Sensor & SDK intelligent cable which provides power to the sensor and connectivity to our complimentary GasLab software (downloadable from our website <http://www.co2meter.com/pages/downloads> ) allowing for sensor configuration & data logging. This will help you to verify your data & operation of the sensor.

If moisture is present in the gas sample, you will want to install the water trap, hydrophobic filter & particulate filter included in the Sensor Pump Kit prior to the sensors for protection.

In addition, Nafion tubing is recommended to remove water vapor from the gas sample providing additional protection to the sensor.

Part Numbers for all items listed can be found in App Note AN129